

CLAIMS

Sub A1

1) Method for producing an electronic module in the shape of a ball housing combining a network of interconnection or shielding balls (7) or geometrically identical preforms and surface-mounted components (2) on the same side of a substrate (1), thus making this module directly connectable by soldering to a printed circuit (3), wherein soldering cream (8) is deposited simultaneously for the components and the interconnection or shielding balls located on the same surface and wherein the said components are transferred onto the corresponding mounting lands and wherein the interconnection balls with a diameter greater than the height of said components are transferred collectively onto the lands of the same side intended for them by an appropriate device and wherein a single reflow cycle permits simultaneous soldering of the components and the interconnection or shielding balls onto the substrate.

2) Method as claimed in claim 1, wherein the soldering cream (8) is deposited via serigraphy.

3) Method as claimed in claim 1, wherein the soldering cream (8) is deposited by syringe.

Sub A2

4) Method as claimed in claims 1 to 3, wherein it makes it possible to produce an electromagnetic shield (18) integrated directly into the electronic module by conducting connections (19)(21) to the ground plane (20) of the circuit (3).

5) Method as claimed in claims 1 to 3, wherein it makes it possible to integrate as close to the connecting balls (7) as possible and on the same side of the electronic module decoupling capacitors (17) and/or serial resistors (16) and/or filtering cells and/or quartz adapter condensers.

6) Method as claimed in claims 1 to 5, wherein the side of the module opposite the side comprising the balls and the components allows gripping of the module by suction.

7) Gripping and collective transfer device (9) for balls (7) or geometrically identical preforms, wherein it has a working face (11) whose configuration is adapted to the dimensions and to the volume of the balls or preforms to be gripped and makes it possible to avoid any contact with

008300337 042401

A2 ~~the electronic components (2) or any other obstacle that might be present on the surface (12) of the substrate (1).~~

8) Device as claimed in claim 7, wherein the gripping device (9) is equipped with a vacuum chamber (13) into which open all of the orifices for holding the balls or preforms (7) in order to seize and place all of said balls simultaneously.

9) Device as claimed in claim 7, wherein the working face (11) of the gripping device (9) defining the face for holding the balls or preforms (7) is adapted to the dimensions of these balls or preforms and to the shape of the receiver substrate (12).

Add B2

Add C1

09830253 042401